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15 [Material Name] Abstract 1

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[Document title] Claims

[Claim 1]

An endermic liniment comprising
antibacterial zeolite and polyoxyethylene
5 polyoxypropylene 2-decyltetradecyl ether.

[Claim 2]

The endermic liniment of claim 1 wherein the
polyoxyethylene unit of the polyoxyethylene
polyoxypropylene 2-decyltetradecyl ether is 20-28
10 E.O. and the polyoxypropylene unit is 10-16 P.O.

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[Document title] Specifications

[Title of the Invention] An Endermic Liniment

[Technical Field]

[0001]

5 The present invention relates to an endermic
liniment. More specifically, the present
invention relates to an endermic liniment
containing antibacterial zeolite that has superior
anti-staining properties.

10 [Background art]

[0002]

 Antibacterial zeolite is blended into
endermic liniments including cosmetics and quasi-
drugs as a preservative and/or odor eliminating
15 agent.

[0003]

 For example, a composition for antibacterial
sprays (see Patent Document 1) and deodorizing
cosmetics (see Patent Document 2) containing
20 antibacterial zeolite have been developed. Also,
technology that blends silicone into antibacterial
zeolite as a deodorizing cosmetic with improved
anti-discoloring properties has been disclosed
(see Patent Document 3).

25 [0004]

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However, there has been no report on endermic liniments and/or cosmetics with improved anti-staining properties.

[0005]

5 On the other hand, polyoxyethylene polyoxypropylene 2-decyltetradecyl ether is publicly known as a surfactant to be blended into cosmetics (see Patent Document 4).

[0006]

10 [Patent Document 1] Japanese Patent Laid-Open No. S63-250325 bulletin

[Patent Document 2] Japanese Patent Laid-Open No. H8-26956 bulletin

15 [Patent Document 3] Japanese Patent Laid-Open No. H8-92051 bulletin

[Patent Document 4] Japanese Patent No. 3323339 bulletin

[Summary of the invention]

[Problem that the present invention aims to solve]

20 [0007]

Antibacterial zeolite by itself is a stable ingredient for an endermic liniment.

However, when antibacterial zeolite is blended into an endermic liniment, discoloration
25 occurs and clothing can be stained if this adheres

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to the clothing.

[0008]

The cause of this discoloration is not clear; there are many raw materials in an endermic
5 liniment and reactions with such raw materials or their impurities are believed to cause subtle discoloration.

[0009]

For example, the inventors verified that
10 blending antibacterial zeolite as a preservative or odor eliminating agent in an antiperspirant cosmetic containing aluminum hydroxychloride causes discoloration that is not preferable for the cosmetic's appearance.

15 [0010]

The inventors also verified that perspiration and sunlight can cause undesirable discoloration in an antiperspirant cosmetic and clothing is stained if this adheres to it.

20 [0011]

In view of the aforementioned problem, the inventors conducted earnest research and amazingly discovered that antibacterial zeolite and polyoxyethylene polyoxypropylene 2-decyltetradecyl
25 ether, when used together, have an anti-staining

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effect and thus completed the present invention.

[0012]

The object of the present invention is to provide an endermic liniment containing

5 antibacterial zeolite that has the superb effect of preventing the staining of clothes.

[Means to solve the Problem]

[0013]

That is, the present invention provides an
10 endermic liniment comprising antibacterial zeolite and polyoxyethylene polyoxypropylene 2-decyltetradecyl ether.

[0014]

Also, the present invention provides the
15 aforementioned endermic liniment wherein the polyoxyethylene unit of the polyoxyethylene polyoxypropylene 2-decyltetradecyl ether is 20-28 E.O. and the polyoxypropylene unit is 10-16 P.O.

[Effects of the invention]

20 [0015]

The present invention can provide an endermic liniment containing antibacterial zeolite that exhibits the effect of preventing staining of clothing due to adhesion of the endermic liniment
25 and/or reducing the degree of such staining.

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[The best embodiments of the present invention]

[0016]

The present invention is described in detail below.

5 [0017]

The antibacterial zeolite used in the present invention is zeolite that holds antibacterial metal ions in its ion-exchangeable parts.

10 i.e. zeolite whose exchangeable ions are partly or entirely replaced by antibacterial metal ions. In the present invention, zeolite having ammonium ion substitution in addition to antibacterial zeolite ion substitution is also
15 preferable.

[0018]

For the zeolite, either natural zeolite or synthetic zeolite can be used. Zeolite is aluminosilicate having a three dimensional
20 skeletal structure; it is represented by the general formula $XM_{2/n}O \cdot Al_2O_3 \cdot YSiO_2 \cdot ZH_2O$. In this general formula, M denotes an exchangeable ion, usually a monovalent or divalent metal ion. n denotes the atomic valence of the (metal) ion. X
25 and Y denote metal oxide and the silica factor,

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respectively, and Z denotes the number of the crystallization water molecules.

[0019]

Specific examples of zeolite include A-type
5 zeolite, X-type zeolite, Y-zeolite, T-type, high
silica zeolite, sodalite, mordenite, analcime,
crinoptyrolite, chabasite, and erionite. The ion
exchange capacity of these zeolites are: 7 meq/g
for A-type zeolite, 6.4 meq/g for X-type zeolite,
10 5 meq/g for Y-zeolite, 3.4 meq/g for T-type, 11.5
meq/g for sodalite, 2.6 meq/g for mordenite, 5
meq/g for analcime, 2.6 meq/g for crinoptyrolite,
5 meq/g for chabasite, and 3.8 meq/g for erionite.
Any of these has enough capacity for ion exchange
15 with antibacterial metal ions and/or ammonium ions.

[0020]

Examples of exchangeable ions in zeolite
include sodium ions, calcium ions, potassium ions,
magnesium ions, and iron ions.

20 Examples of the antibacterial metal ions to
substitute for these ions include silver, copper,
zinc, mercury, tin, lead, bismuth, cadmium,
chromium, and thallium ions; preferably silver,
copper, or zinc ions, and more preferably silver
25 ions.

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[0021]

The content of the antibacterial ions is preferably 0.1-15 mass % of the zeolite.

[0022]

5 For example, antibacterial zeolite containing 0.1-15% of silver ion and 0.1-8 mass % of copper ion or zinc ion is preferable. On the other hand, zeolite can contain up to 20 mass % of ammonium ions; however, for the purpose of
10 effectively preventing discoloration of the zeolite, 0.5-5% is preferable and 0.5-2 mass % is more preferable. "Mass %" means the mass percentage in 110°C dry standard zeolite.

[0023]

15 In the present invention, commercial products can be used for the antibacterial zeolite; the antibacterial zeolite can also be prepared by the following method, for example.

That is, zeolite is exposed to a mixed
20 solution containing antibacterial metal ions such as silver ions, copper ions, and zinc ions, prepared in advance, to substitute the aforementioned ions for the exchangeable ions in the zeolite.

25 [0024]

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The exposure can be achieved by the batch method or continuous method (column method, for example) for 3-24 hours, preferably 10-24 hours, at 10-70°C, preferably 40-60°C.

5 [0025]

The pH of the aforementioned mixed solution should be adjusted to 3-10, preferably 5-7. This adjustment is preferable because it prevents precipitation of silver oxide and such on the zeolite surface or in the fine pores. Each ion in the mixed aqueous solution is usually supplied in the form of a salt. For example, silver ions are from silver nitrate, silver sulfate, silver perchlorate, diamminesilver nitrate, diamminesilver sulfate, etc.; copper ions are from copper nitrate (II), copper perchlorate, copper acetate, potassium tetracyanocuprate, copper sulfate, etc.; zinc ions are from zinc nitrate (II), zinc sulfate, zinc perchlorate, zinc thiocyanate, zinc acetate, etc.; mercury ions are from mercury perchlorate, mercury nitrate, and mercury acetate; tin ions are from tin sulfate and such; lead ions are from lead sulfate, lead nitrate, etc.; bismuth ions are from bismuth chloride, bismuth iodide, etc.; cadmium ions are

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from cadmium perchlorate, cadmium sulfate, cadmium nitrate, and cadmium acetate; chromium ions are from chromium perchlorate, chromium sulfate, chromium ammonium sulfate, chromium nitrate, etc.;

5 thallium ions are from thallium perchlorate, thallium sulfate, thallium nitrate, thallium acetate, etc.

[0026]

The antibacterial metal ion content in the
10 zeolite can be controlled by adjusting the concentration of each ion (salt) in said mixed aqueous solution.

[0027]

For example, in the case of antibacterial
15 zeolite containing silver ions, an antibacterial zeolite with a silver ion content of 0.1-5% can be obtained by adjusting the silver ion concentration in said mixed aqueous solution to 0.002M/l-0.15M/l.

In the case of antibacterial zeolite
20 additionally containing copper ions and zinc ions, an antibacterial zeolite with a copper ion content of 0.1-8% and a zinc ion content of 0.1-8% can be obtained by adjusting the silver ion concentration to 0.1M/l-0.85M/l and the zinc ion concentration
25 to 0.15M/l-1.2M/l in said mixed aqueous solution.

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[0028]

For ion exchange of antibacterial zeolite, it is also possible to use solutions, each of which contains each ion, and expose the zeolite with these solutions one after another. The concentration of each ion in each aqueous solution can be determined based on the concentration of each ion in said mixed aqueous solution.

[0029]

After the completion of the ion exchange, the zeolite is thoroughly rinsed and then dried. The drying is preferably done at 105°C-115°C, or under a reduced pressure (1-30 Torr) at 70-90°C.

[0030]

Ion exchange for organic ions and/or for ions for which there isn't an adequate water soluble salt, such as tin and bismuth, can be done by using an organic solvent solution such as an alcohol or acetone to prevent precipitation of slightly soluble basic salts.

[0031]

The blend ratio of the antibacterial zeolite in the endermic liniment is not limited in particular. It is determined based on the reason why the antibacterial zeolite is added and also on

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the product form of the endermic liniment.

[0032]

For example, when blended in as a preservative, the blend ratio is usually 0.05-10 mass % of the total amount of the endermic liniment.

[0033]

As another example, when blended in as a bactericide, the blend ratio is usually 0.1-90 mass % of the total amount of the endermic liniment, depending on the product form.

For example, for lotion or cream type endermic liniments 0.1-20 mass % of the total amount of the endermic liniment is preferable; for powder type endermic liniments 0.5-80 mass % of the total amount of the endermic liniment is preferable; for stick type endermic liniments 0.5-60 mass % of the total amount of the endermic liniment is preferable; and for spray type endermic liniments 0.5-50 mass % of the total amount of the endermic liniment is preferable.

[0034]

Polyoxyethylene polyoxypropylene 2-decyltetradecyl ether used in the present invention is a prior art ingredient of endermic

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liniments as a surfactant. It is usually blended into lotion as a solubilizing agent.

[0035]

In the present invention, polyoxyethylene
5 polyoxypropylene 2-decyltetradecyl ether (20-28 E.O.) (10-16 P.O.) is preferable; it specifically acts as an anti-staining agent for endermic liniments containing antibacterial zeolite.

Other surfactants known as solubilizing
10 agents for perfume, such as polyoxyethylene (E.O. 60) hydrogenated castor oil, do not have an anti-staining effect for endermic liniments.

[0036]

The blend ratio of the polyoxyethylene
15 polyoxypropylene 2-decyltetradecyl ether (20-28 E.O.) (10-16 P.O.) is determined based on the blend ratio of the antibacterial zeolite and the product form. It is usually 0.01-5 mass % of the total amount of the endermic liniment.

20 [0037]

When using the endermic liniment of the present invention for applications such as odor eliminating agents and antiperspirant cosmetics, it is preferable to blend in an aluminum compound
25 that is an antiperspirant.

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[0038]

In addition to the aforementioned essential ingredients, other ingredients commonly used in endermic liniments, for example one, two or more
5 of those listed below, are blended as necessary in the endermic liniment of the present invention; the preparation can be conducted for the target formulation with a conventional method.

[0039]

10 Examples of the powder ingredients include inorganic powders (for example, talc, kaolin, mica, sericite, muscovite, phlogopite, synthetic mica, lepidolite, biotite, vermiculite, magnesium carbonate, calcium carbonate, aluminum silicate,
15 barium silicate, calcium silicate, magnesium silicate, strontium silicate, tungstic acid metal salt, magnesium, silica, barium sulfate, firing calcium sulfate (calcined gypsum), calcium phosphate, fluorine-apatite, hydroxy apatite,
20 ceramic powder, metallic soaps (for example, zinc myristate, calcium palmitate, and aluminum stearate), and boron nitride); organic powders (for example, polyamide resin powder (nylon powder), polyethylene powder, poly methyl
25 methacrylate powder, benzoguanamine resin powder,

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polytetrafluoroethylene powder, and cellulose powder); inorganic white pigments (for example, titanium dioxide and zinc oxide); inorganic red pigments (for example, iron oxide (red iron oxide) and iron titanate); inorganic brown pigments (for example, γ -iron oxide); inorganic yellow pigments (for example, yellow iron oxide and loess); inorganic black pigments (for example, black iron oxide and low oxides of titanium); inorganic purple pigments (for example, manganese violet, cobalt violet); inorganic green pigments (for example, chromium oxide, chromium hydroxide, and cobalt titanate); inorganic blue pigments (for example, ultramarine blue and Berlin blue); pearl pigment (for example, titania coated mica, titania coated bismuth oxychloride, titania coated talc, coloration titania coated mica, bismuth oxychloride, fish scale flakes); metal powder pigments (for example, aluminum powder, copper powder); organic pigments such as Zr, barium or aluminum rake (for example, organic pigments such as red 201, red 202, red 204, red 205, red 220, red 226, red 228, red 405, orange 203, orange 204, yellow 205, yellow 401 and blue 404, as well as red 3, red 104, red 106, red 227, red 230, red 401,

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red 505, orange 205, yellow 4, yellow 5, yellow 202, yellow 203, green 3 and blue 1; and natural colors (for example, chlorophyll and β -carotene).

[0040]

5 Examples of the liquid fats and oils include avocado oil, tsubaki oil, turtle fatty acid, macademia nut oil, corn oil, mink oil, olive oil, rapeseed oil, egg yolk oil, sesame oil, persic oil, wheat germ oil, sasanqua oil, castor oil, linseed
10 oil, safflower oil, cotton seed oil, perilla oil, soybean oil, peanut oil, tea seed oil, Japanese nutmeg oil, rice bran oil, Chinese gimlet oil, Japan gimlet oil, jojoba oil, germ oil, and triglycerin.

15 [0041]

 Examples of the solid fats and oils include cacao butter, coconut oil, hydrogenated coconut oil, palm oil, palm kernel oil, Japanese core wax nucleus oil, hydrogenated oil, Japanese core wax,
20 and hydrogenated castor oil.

[0042]

 Examples of the waxes include beeswax, candelilla wax, cotton wax, carnauba wax, bayberry wax, tree wax, whale wax, montan wax, bran wax,
25 lanolin, kapok wax, lanolin acetate, liquid

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lanolin, sugar cane wax, lanolin fatty acid
isopropyl ester, hexyl laurate, reduced lanolin,
jojoba wax, hard lanolin, shellac wax, POE lanolin
alcohol ether, POE lanolin alcohol acetate, POE
5 cholesterol ether, lanolin fatty acid polyethylene
glycol, POE hydrogenated lanolin ethyl alcohol
ether, ceresin, and microcrystalline wax.

[0043]

Examples of the hydrocarbon oils include
10 liquid petrolatum, ozocerite, squalane, pristane,
paraffin, squalene, and petrolatum.

[0044]

Examples of the higher fatty acids include
lauric acid, myristic acid, palmitic acid, stearic
15 acid, behenic acid, oleic acid, undecylenic acid,
isostearic acid, linolic acid, linoleic acid,
eicosapentaenoic acid (EPA), and docosahexaenoic
acid (DHA).

[0045]

20 Examples of the higher alcohols include
straight chain alcohols (for example, lauryl
alcohol, cetyl alcohol, stearyl alcohol, behenyl
alcohol, myristyl alcohol, oleyl alcohol, and
cetostearyl alcohol) and branched chain ethyl
25 alcohols (for example, mono stearyl glycerin ether

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(batyl alcohol), 2-decyltetradecynol, lanolin alcohol, cholesterol, phytosterol, hexyl dodecanol, iso stearyl alcohol, and octyl dodecanol).

[0046]

5 Examples of the ester oils include isopropyl myristate, cetyl octanoate, octyl dodecyl myristate, isopropyl palmitate, butyl stearate, hexyl laurate, myristil myristate, decyl oleate, dimethyl hexyl decyl octanoate, cetyl lactate, 10 myristil lactate, lanolin acetate, iso cetyl stearate, iso cetyl isostearate, cholesteryl hydroxy 12-stearate, di-2-ethylene glycol ethylhexanoate, dipentaerythritol fatty acid ester, N-alkylene glycol monoisostearate, neopentyl 15 glycol dicaprates, diisostearyl malate, glyceryl di-2-heptylundecanoate, trimethylolpropane tri-2-ethylhexanoate, trimethylolpropane triisostearate, tetra-2-pentaerythritol ethylhexanoate, glycerin tri-2-ethylhexanoate, glyceryl trioctanoate, 20 glycerin triisopalmitate, trimethylolpropane triisostearate, cetyl 2-ethyl hexanoate, 2-ethylhexyl palmitate, glycerin trimyristate, tri-2-heptyl undecanoic acid glyceride, methyl castor oil fatty acid, oleyl oleate, aceto glyceride, 2- 25 heptyl undecyl palmitate, diisobutyl adipate, 2-

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octyldodecyl N-lauroyl-L-glutamate, di-2-heptyl
undecyl adipate, ethyl laurate, di-2-ethylhexyl
sebacate, 2-hexyl decyl myristate, 2-hexyl decyl
palmitate, 2-hexyl decyl adipate, diisopropyl
5 sebacate, 2-ethylhexyl succinate, and triethyl
citrate.

[0047]

Examples of the silicone oils include chain
polysiloxanes (for example, dimethylpolysiloxane,
10 methylphenyl polysiloxane, and diphenyl
polysiloxane); ring polysiloxanes (for example,
octamethylcyclotetrasiloxane, decamethyl
cyclopenta siloxane, and dodecamethyl cyclohexa
siloxane), silicone resins forming a three-
15 dimensional network structure, silicone rubbers,
and various modified polysiloxanes (amino-modified
polysiloxane, polyether-modified polysiloxane,
alkyl-modified polysiloxane, and andfluorine-
modified polysiloxane).

20 [0048]

Examples of the anionic surfactants include
fatty acid soaps (for example, sodium laurate and
sodium palmitate); higher alkyl sulfuric ester
salts (for example, sodium lauryl sulfate and
25 potassium laurylsulfate); alkylether sulfuric

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ester salts (for example, POE-triethanolamine laurylsulfate and sodium POE-lauryl sulfate); N-acyl sarcosinic acids (for example, sodium N-lauroyl sarcosinate); higher fatty acid ester sulfates (for example, hydrogenated coconut oil aliphatic acid glycerin sodium sulfate); N-acyl glutamates (for example, mono sodium N-lauroylglutamate, disodium N-stearoylglutamate, and sodium N-myristoyl-L-glutamate); sulfated oils (for example, turkey red oil); POE-alkylether carboxylic acid; POE-alkylarylether carboxylate; α -olefin sulfonate; higher fatty acid ester sulfonates; sec-alcohol sulfates; higher fatty acid alkyl amide sulfates; sodium lauroyl monoethanolamine succinates; ditriethanolamine N-palmitoylaspartate; and sodium caseinate.

[0049]

Examples of the cationic surfactants include alkyltrimethylammonium salts (for example, stearyltrimethyl ammonium chloride and lauryltrimethyl ammonium chloride) alkylpyridinium salts (for example, cetylpyridinium chloride), distearyldimethylammonium chloride dialkyldimethylammonium salt; poly (N,N'-dimethyl-3,5-methylene piperidinium) chloride; alkyl

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quaternary ammonium salts; alkyl dimethylbenzyl
ammonium salts; alkyl isoquinolinium salts;
dialkylmorpholine salts; POE alkyl amines; alkyl
amine salts; polyamine fatty acid derivatives;
5 amylalcohol fatty acid derivatives; benzalkonium
chloride; and benzethonium chloride.

[0050]

Examples of the ampholytic surfactants
include: imidazoline type ampholytic surfactants
10 (for example, 2-undecyl-N,N,N-(hydroxyethyl
carboxymethyl)-2-imidazoline sodium salt and 2-
cocoyl-2-imidazolinium hydroxide-1-carboxyethyloxy
2 sodium salt); and betaine type surfactants (for
example, 2-heptadecyl-n-carboxymethyl-N-
15 hydroxyethyl imidazolinium betaine,
lauryldimethylaminoacetic acid betaine, alkyl
betaine, amide betaine, and sulfobetaine).

[0051]

Examples of the lipophilic nonionic surface
20 active agent include sorbitan fatty acid esters
(for example, sorbitan mono oleate, sorbitan mono
isostearate, sorbitan mono laurate, sorbitan mono
palmitate, sorbitan mono stearate, sorbitan sesqui
oleate, sorbitan trioleate, diglycerol sorbitan
25 penta-2-ethylhexylate, diglycerol sorbitan tetra-

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2-ethylhexylate); glycerin polyglycerin aliphatic acids (for example, mono-cottonseed oil fatty acid glycerin, glyceryl monoerucate, glycerin sesquioleate, glyceryl monostearate, α, α' -glyceryl oleate pyroglutamate, glyceryl monostearate mono malate); propylene glycol fatty acid esters (for example, propylene glycol monostearate); hydrogenated castor oil derivatives; and glycerin alkylethers.

10 [0052]

Examples of the hydrophilic nonionic surface active agents include: POE-sorbitan fatty acid esters (for example, POE-sorbitan monooleate, POE-sorbitan monostearate, POE-sorbitan monooleate, and POE-sorbitan tetraoleate); POE sorbitol fatty acid esters (for example, POE sorbitol monolaurate, POE-sorbitol monooleate, POE-sorbitolpentaoleate, and POE-sorbitol monostearate); POE-glycerin fatty acid esters (for example, POE-monooleates such as POE-glycerin monostearate, POE-glycerin monoisostearate, and POE-glycerin triisostearate); POE-fatty acid esters (for example, POE-distearate, POE-monodioleate, and ethylene glycol distearate); POE-alkylethers (for example, POE-lauryl ether, POE-oleyl ether, POE-stearyl ether, POE-behenyl

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ether, POE-2-octyl dodecyl ether, and POE-cholesterol ether); POE/POP-alkylethers (for example, POE/POP-cetyl ether, POE/POP-2-decyl tetradecyl ether, POE/POP-monobutyl ether, 5 POE/POP-lanolin hydrate, and POE/POP-glycerin ether); POE-castor oil hydrogenated castor oil derivatives (for example, POE-castor oil, POE-hydrogenated castor oil, POE-hydrogenated castor oil monoisostearate, POE-hydrogenated castor oil 10 triisostearate, POE-hydrogenated castor oil monopyroglutamic monoisostearic diester, and POE-hydrogenated castor oil maleic acid); POE-beeswax/lanolin derivatives (for example, POE-sorbitol beeswax); alkanol amides (for example, 15 coconut fatty acid diethanol amide, lauric acid monoethanol amide, and aliphatic acid isopropanol amide); POE-propylene glycol fatty acid esters; POE-alkyl amine; POE-fatty acid amide; sucrose fatty acid ester; alkyl ethoxy dimethylamine 20 oxides; and trioctyl phosphoric acid.

[0053]

Examples of the humectant include polyethylene glycol, propylene glycol, glycerin, 1,3-butylene glycol, xylitol, sorbitol, maltitol, 25 chondroitin sulfate, hyaluronic acid, mucoitin

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sulfuric acid, charonic acid, atelocollagen,
cholesteryl-12-hydroxy stearate, sodium lactate,
bile salt, dl-pyrrolidone carboxylic acid salt,
short chain soluble collagen, diglycerin (EO)PO
5 adduct, chestnut rose fruit extract, yarrow
extract, and sweet clover extract.

[0054]

Examples of the natural water-soluble
polymer include: plant-type polymers {for example,
10 gum arabic, gum tragacanth, galactan, guar gum,
carob gum, karaya gum, carrageenan, pectin, agar,
quince seed (Cydonia oblonga), algae colloids
(brown algae extract), starches (rice, corn,
potato, and wheat), and glycyrrhizic acid};
15 microorganism-type polymers (for example, xanthan
gum, dextran, succinoglucan, and pullulan); and
others (for example, fish-derived collagen, fish-
derived gelatin, wheat protein, and silk proten).

[0055]

20 Examples of the semisynthetic water-soluble
polymers include: starch-type polymers (for
example, carboxymethyl starch and
methylhydroxypropyl starch); cellulosic polymers
(for example, methyl cellulose, ethyl cellulose,
25 methylhydroxypropyl cellulose, hydroxyethyl

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cellulose, cellulose sodium sulfate, hydroxypropyl
cellulose, carboxymethyl-cellulose, sodium
carboxymethyl cellulose, crystal cellulose, and
cellulose powder); and alginic acid-type polymers
5 (for example, sodium alginate and propyleneglycol
alginate).

[0056]

Examples of the synthetic water-soluble
polymers include: vinyl polymers (for example,
10 polyvinyl alcohol, polyvinyl methyl ether,
polyvinylpyrrolidone, carboxy vinyl polymer);
polyoxyethylene-type polymers (for example, a
copolymer of polyethylene glycol 20,000, 40,000,
or 60,000 and polyoxyethylene polyoxypropylene);
15 acrylic polymers (for example, sodium polyacrylate,
polyethylacrylate, and polyacrylamide);
polyethyleneimine; and cationic polymers.

[0057]

Examples of the thickeners include: gum
20 arabic, carrageenan, karaya gum, gum tragacanth,
carob gum, quince seed (Cydonia oblonga), casein,
dextrin, gelatin, sodium pectate, sodium arginate,
methyl cellulose, ethyl cellulose, CMC, hydroxy
ethyl cellulose, hydroxypropyl cellulose, PVA,
25 PVM, PVP, sodium polyacrylate, carboxy vinyl

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polymer, locust bean gum, guar gum, tamarind gum,
cellulose dialkyl dimethylammonium sulfate,
xanthan gum, aluminum magnesium silicate,
bentonite, hectorite, AlMg silicate (beagum),
5 laponite, and silicic acid anhydride.

[0058]

Examples of the ultraviolet absorbents
include the following compounds.

(1) Benzoic acid-type ultraviolet absorbents

10 For example, paraminobenzoic acid (hereafter
abbreviated as PABA), PABA monoglycerin ester,
N,N-dipropoxy PABA ethyl ester, N,N-diethoxy PABA
ethyl ester, N,N-dimethyl PABA ethyl ester, N,N-
dimethyl PABA butyl ester, and N,N-dimethyl PABA
15 ethyl ester.

(2) Anthranilic acid-type ultraviolet absorbents

For example, homo mentyl-N-acetyl
anthranilate.

(3) Salicylic acid-type ultraviolet absorbents

20 For example, amyl salicylate, mentyl
salicylate, homo mentyl salicylate, octyl
salicylate, phenyl salicylate, benzil salicylate,
and p-isopropanol phenyl salicylate.

(4) Cinnamic acid-type ultraviolet absorbents

25 For example, octyl cinnamate, ethyl-4-

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isopropyl cinnamate, methyl-2,5-diisopropyl
cinnamate, ethyl-2,4-diisopropyl cinnamate,
methyl-2,4-diisopropyl cinnamate, propyl-p-methoxy
cinnamate, isopropyl-p-methoxy cinnamate, isoamyl-
5 p-methoxy cinnamate, octyl-p-methoxy cinnamate (2-
ethylhexyl-p-methoxy cinnamate), 2-ethoxyethyl-p-
methoxy cinnamate, cyclohexyl-p-methoxy cinnamate,
ethyl- α -cyano- β -phenyl cinnamate, 2-ethylhexyl-
 α -cyano- β -phenyl cinnamate, and glyceryl mono-2-
10 ethyl hexanoyl-diparamethoxy cinnamate.

(5) Triazine-type ultraviolet absorbents

For example, bisresorsinyl triazine.

More specifically, bis{[4-(2-ethylhexyloxy)-
2-hydroxy]phenyl}-6-(4-methoxyphenyl)1,3,5-
15 triazine, 2,4,6-tris{4-(2-ethylhexyloxycarbonyl)
anilino}1,3,5-triazine, etc.

(6) Other ultraviolet absorbents

For example, 3-(4'-methylbenzylidene)-d,l-
camphor, 3-benzylidene-d,l-camphor, 2-phenyl-5-
20 methyl benzoxazol, 2-(2'-hydroxy-5'-methylphenyl)
benzotriazol, 2-(2'-hydroxy-5'-t-octylphenyl)
benzotriazol, 2-(2'-hydroxy-5'-methylphenyl
benzotriazol, dibenzaladine, dianisoylmethane, and
4-methoxy-4'-t-butyl dibenzoyl-methane, 5-(3,3-
25 dimethyl-2-norbornylidene)-3-pentane-2-one.

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Pyridazinone derivatives such as dimorpholino
pyridazine.

[0059]

Examples of the sequestering agents include:

5 1-hydroxy ethane-1,1-diphosphonic acid, 1-hydroxy
ethane-1,1-diphosphonic acid tetrasodium salt,
disodium edetate, trisodium edetate, tetrasodium
edetate, sodium citrate, sodium polyphosphate,
sodium metaphosphate, gluconic acid, phosphoric
10 acid, citric acid, ascorbic acid, and succinic
acid.

[0060]

Examples of the lower alcohols include

ethanol, propanol, isopropanol, isobutanol, and t-
15 butyl alcohol.

[0061]

Examples of the polyhydric alcohols include:

dihydric alcohols (for example, ethylene glycol,
propylene glycol, trimethylene glycol, 1,2-
20 butylene glycol, 1,3-butylene glycol,
tetramethylene glycol, 2,3-butylene glycol,
pentamethylene glycol, 2-butene-1,4-diol, hexylene
glycol, and octylene glycol); trihydric alcohols
(for example, glycerin and trimethylolpropane);
25 tetrahydric alcohols (for example, pentaerythritol

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such as 1,2,6-hexanetriol); pentahydric alcohols (for example, xylitol); hexahydric alcohols (for example, sorbitol, mannitol); polyhydric alcohol polymers (for example, diethylene glycol, 5 dipropylene glycol, triethylene glycol, polypropylene glycol, tetraethylene glycol, diglycerin, polyethylene glycol, triglycerin, tetraglycerin, and polyglycerin); dihydric alcohol alkylethers (for example, ethylene glycol 10 monomethyl ether, ethylene glycol monoethyl ether, ethylene glycol monobutyl ether, ethylene glycol monophenyl ether, ethylene glycol monohexyl ether, ethylene glycol mono 2-methyl hexyl ether, ethylene glycol isoamyl ether, ethylene glycol 15 benzyl ether, ethylene glycol isopropyl ether, ethylene glycol dimethylether, ethylene glycol diethyl ether, and ethylene glycol dibutyl ether); dihydric alcohol ether esters (for example, ethylene glycol monomethyl ether acetate, ethylene 20 glycol monoethyl ether acetate, ethylene glycol monobutyl ether acetate, ethylene glycol monophenyl ether acetate, ethylene glycol diadipate, ethylene glycol disuccinate, diethylene glycol monoethyl ether acetate, diethylene glycol 25 monobutyl ether acetate, propylene

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glycolmonomethyl ether acetate, propylene glycol
monoethyl ether acetate, propylene glycol
monopropyl ether acetate, and propylene glycol
monophenyl ether acetate); glycerin mono alkyl
5 ethers (for example, xylyl alcohol, selachyl
alcohol, and butyl alcohol); sugar alcohols (for
example, sorbitol, maltitol, maltotriose, mannitol,
sucrose, erythritol, glucose, fructose, starch
amylolysis sugar, maltose, xylitose, and alcohol
10 prepared by the reduction of starch amylolysis
sugar); glysolid; tetrahydro furfuryl alcohol;
POE-tetrahydro furfuryl alcohol; POP-butyl ether;
POP/POE-butyl ether; tripolyoxypropylene glycerin
ether; POP-glycerin ether, POP-glycerin ether
15 phosphoric acid; POP/POE-pentane erythritol ether,
and polyglycerin.

[0062]

Examples of the monosaccharides include:
trioses (for example, D-glyceryl aldehyde and
20 dihydroxyacetone); tetroses (for example, D-
erythrose, D-erythrulose, D-threose, and
erythritol); pentoses (for example, L-arabinose,
D-xylose, L-lyxose, D-arabinose, D-ribose, D-
ribulose, D-xylulose, and L-xylulose); hexoses
25 (for example, D-glucose, D-talose, D-psicose, D-

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galactose, D-fructose, L-galactose, L-mannose, and
D-tagatose); heptoses (for example, aldoheptose
and heprose); octoses (for example, octurose);
deoxysugars (for example, 2-deoxy-D-ribose, 6-
5 deoxy-L-galactose, and 6-deoxy-L-mannose); amino
sugars (for example, D-glucosamine, D-
galactosamine, sialic acid, amino uronic acid, and
muramic acid); and uronic acid (for example, D-
glucuronic acid, D-mannuronic acid, L-guluronic
10 acid, D-galacturonic acid, and L-iduronic acid).

[0063]

Examples of the oligosaccharides include
sucrose, umbelliferose, lactose, planteose,
isolignoses, α , α -trehalose, raffinose, lignoses,
15 umbilicine, stachyose and verbascose.

[0064]

Examples of the polysaccharides include
cellulose, quince seed, chondroitin sulfate,
starch, galactan, dermatan sulfate, glycogen, gum
20 arabic, heparan sulfate, hyaluronic acid, traganth
gum, keratan sulfate, chondroitin, xanthan gum,
mucoitin sulfuric acid, guar gum, dextran, kerato
sulfate, locustbean gum, succinoglucane, and
charonic acid.

25 [0065]

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Examples of the amino acids include neutral amino acids (for example, threonine and cysteine) and basic amino acids (for example, hydroxylysine).

Examples of the amino acid derivatives include

5 sodium acyl sarcosinate (sodium N-lauroyl sarcosinate), acyl glutamate, acyl β -alanine sodium, glutathione, and pyrrolidone carboxylic acid.

[0066]

10 Examples of the organic amines include monoethanolamine, diethanolamine, triethanolamine, morpholine, triisopropanolamine, 2-amino-2-carbinyl-1,3-propanediol, and 2-amino-2-carbinyl-1-propanol.

15 [0067]

Examples of the high polymer emulsions include acrylic resin emulsions, ethyl polyacrylate emulsions, acryl resin liquids, polyacrylic alkyl ester emulsions, polyvinyl acetate resin emulsions, and natural rubber latex.

[0068]

Examples of the pH adjustment agents include buffers such as lactic acid-sodium lactate, citric acid-sodium citrate, and succinic acid-sodium succinate.

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[0069]

Examples of the vitamins include vitamins A, B1, B2, B6, C and E as well as their derivatives, pantothenic acid and its derivatives, and biotin.

5 [0070]

Examples of the antioxidants include tocopherols, dibutyl hydroxytoluene, butyl hydroxyanisole, and gallic ester.

[0071]

10 Examples of the antioxidation auxiliary agents include phosphoric acid, citric acid, ascorbic acid, maleic acid, malonic acid, succinic acid, fumaric acid, cephalin, hexameta phosphate, phytic acid, and ethylene diamine tetraacetic acid.

15 [0072]

Examples of other possible ingredients include antiseptics (methylparaben, ethylparaben, butylparaben, and phenoxyethanol); anti-inflammatory agents (for example, glycyrrhizic acid derivatives, glycyrrhetinic acid derivatives, salicylic acid derivatives, hinokitiol, zinc oxide, and allantoin); whitening agents (for example, creeping saxifrage extract, arbutin, tranexamic acid, L-ascorbic acid, magnesium L-ascorbyl phosphate, L-ascorbic acid glucoside, and potassium

25

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4-methoxysalicylate); various extracts (for example, Phellodendri Cortex, goldthread, lithospermum root, Paeonia lactiflora, Swertia japonica, Birch, sage, loquat, carrot, aloe, Malva sylvestris, Iris, grape, Coix ma-yuen, sponge gourd, lily, saffron, Cnidium officinale, sheng jiang, Hypericum erectum, Ononis, garlic, Guinea pepper, chen pi, Ligusticum acutilobum, and seaweed), activators (royal jelly, photosensitive substances, and cholesterol derivatives); blood circulation promoting agents (for example, nonyl acid valenyl amide, nicotinic acid benzyl esters, nicotinic acid β -butoxy ethyl esters, capsaicin, gingeron, cantharis tincture, Ichthammol, tannic acid, α -borneol, tocopherol nicotinate, inositol hexanicotinate, cyclandelate, cinnarizine, tolazoline, acetylcholine, verapamil, cepharanthine, and γ -orizanol); anti-seborrhea agents (for example, sulfur and thiantol); and antiinflammatory agents (for example, thiotaurine and hypotaurine); and bactericides (for example, benzoic acid and its salts, isopropylmethyl phenol, undecylenic acid and its salts, undecylenic acid monoethanol amide, cetyltrimethyl ammonium chloride, cetylpyridinium chloride, benzalkonium

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chloride, benzethonium chloride,
alkyldiaminoethylglycine chloride, chlorhexidine
chloride, orthophenyl phenol, chlorhexidine
gluconate, cresol, chloramine T, chlorxylenol,
5 chlorcresol, chlorfenesis, chlorobutanol, 5-
chloro-2-methyl-4-isothiazoline-3-one, salicylic
acid and its salts, 1,3-dimethylol-5,5-
dimethylhidantoin, alkylisoquinolium bromide,
domiphen bromide and its salt, sorbic acid and its
10 salts, thymol, thylum, thiram, dehydroacetic acid
and its salt, triclosan, trichlorocarbanilide,
paraoxybenzoic ester, parachlorophenol, halocarbon,
pyrogallol, phenol, hexachlorophene, 2-methyl-4-
isothiazoline-3-one, NN"-Methylenebis(N'-(3-
15 hydroxymethyl-2,5-dioxo-4-imidazolidinyl)urea),
sodium layroylsarcosine, and resorcin).

[Examples]

[0073]

The present invention is described in detail
20 below by referring to Examples. The present
invention is not limited to them. The blend
ratios are in mass-percentage units unless
specified otherwise.

[0074]

25 Recipes shown in Table 1 and Table 2 were

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used to prepare powder lotion-type antiperspirant lotions and a prescribed amount (4 micrograms/cm²) is applied on clothing. The clothing was exposed to sunlight (10 minutes) and washed with common
5 laundry detergent in a washing machine; the degree of staining was then evaluated by visual observation. For Comparative examples, recipes not containing polyoxyethylene polyoxypropylene 2-decyltetradecyl ether (20-28 E.O.) (10-16 P.O.)
10 and recipes containing polyoxyethylene (E.O. 60) were investigated. The degree of staining was evaluated by giving ○ to those that are within the acceptable range for endermic liniments, and × to those that are outside of this range.

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[0075]

[Table 1]

	Examples			Comparative examples			
	1	2	3	1	2	3	4
Ion-exchanged water	Balance	Balance	Balance	Balance	Balance	Balance	Balance
Ethanol (95%, synthesized)	50	50	50	50	50	50	50
Aluminum hydroxychloride 50% aqueous solution (anti-perspirant)	20	20	20	20	20	20	20
Antibacterial zeolite A (preservative)	1	1	1	1	1	1	1
Polyoxyethylene polyoxypropylene 2-decyltetradecyl ether (27 E.O.) (11 P.O.)	0.1	0.5	2.5	-	-	-	-
Polyoxyethylene (E.O. 60) hydrogenated castor oil	-	-	-	-	0.1	0.5	2.5
Total	100	100	100	100	100	100	100
Staining	○	○	○	×	×	×	×

Antibacterial zeolite A: Zeolite containing silver ions and zinc ions (average particle size approximately 1.5 micrometers)

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[Table 2]

	Examples			Comparative examples			
	4	5	6	5	6	7	8
Ion-exchanged water	Balance	Balance	Balance	Balance	Balance	Balance	Balance
Ethanol (95%, synthesized)	50	50	50	50	50	50	50
Aluminum hydroxychloride 50% aqueous solution (anti-perspirant)	20	20	20	20	20	20	20
Antibacterial zeolite B (preservative)	1	1	1	1	1	1	1
Polyoxyethylene polyoxypropylene 2-decyltetradecyl ether (27 E.O.) (11 P.O.)	0.1	0.5	2.5	-	-	-	-
Polyoxyethylene (E.O. 60) hydrogenated castor oil	-	-	-	-	0.1	0.5	2.5
Total	100	100	100	100	100	100	100
Staining	O	O	O	x	x	x	x

Antibacterial zeolite B: Zeolite containing silver ions, zinc ions, and ammonium ions (Zeomic AJ10N from Sinanen Zeomic Co., Ltd., average particle size approximately 1.5 micrometers)

[0076]

The aforementioned results indicate that staining is significant on Comparative examples not containing polyoxyethylene polyoxypropylene 2-decyltetradecyl ether (20-28 E.O.) (10-16 P.O.) and Comparative examples containing polyoxyethylene (E.O. 60) instead of

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polyoxyethylene polyoxypropylene 2-decyltetradecyl
ether (20-28 E.O.) (10-16 P.O.).

On the other hand, Examples containing
polyoxyethylene polyoxypropylene 2-decyltetradecyl
5 ether (20-28 E.O.) (10-16 P.O.) show very little
staining, which is within the allowable range for
endermic liniments; this indicates superior anti-
staining effects.

[0077]

10 Other Examples of the present invention are
shown below.

[0078]

Example 7: Pressed powder

Aluminum hydroxychloride	5 mass %
15 Zinc oxide (zinc flower)	5
Talc	Balance
Liquid petrolatum	3
Antibacterial zeolite B	10
Polyoxyethylene polyoxypropylene 2-decyltetradecyl	
20 ether (20 E.O.) (16 P.O.)	0.01

[0079]

Example 8: Loose powder

Aluminum hydroxychloride	5 mass %
Zinc oxide (zinc flower)	5
25 Talc	Balance

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Antibacterial zeolite B	10
Polyoxyethylene polyoxypropylene 2-decyltetradecyl ether (22 E.O.) (15 P.O.)	0.05

[0080]

5 Example 9: Lotion-type spray

(Stock solution recipe)

Purified water	10 mass %
Aluminum hydroxychloride	10
Anhydrous ethyl alcohol	Balance

10 Isopropyl myristate	2
1,3-butylene glycol	3
Antibacterial zeolite B	1
Polyoxyethylene polyoxypropylene 2-decyltetradecyl ether (26 E.O.) (13 P.O.)	1

15 (Filler recipe)

Stock solution	50
LPG	50

[0081]

Example 10: Powder spray

20 Aluminum hydroxychloride	20 mass %
Silicic acid anhydride	15
Talc	20
Zinc oxide (zinc flower)	5
Isopropyl myristate	Balance
25 Dimethyl polysiloxane	10

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Sorbitan fatty acid ester	3
Antibacterial zeolite B	5
Polyoxyethylene polyoxypropylene 2-decyltetradecyl ether (24 E.O.) (12 P.O.)	0.1

5 (Filler recipe)

Stock solution	10
LPG	90

[0082]

Example 11: Powder spray

10 Alum	20 mass %
Silicic acid anhydride	15
Talc	20
Zinc oxide (zinc flower)	5
Isopropyl myristate	Balance
15 Polyoxyethylene/polypropylene random polymer methyl ether	10
Sorbitan fatty acid ester	3
Antibacterial zeolite B	5
Polyoxyethylene polyoxypropylene 2-decyltetradecyl ether (27 E.O.) (11 P.O.)	0.1
(Filler recipe)	
Stock solution	10
LPG	90

[0083]

25 Example 12: Stick

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	Aluminum hydroxychloride	20 mass %
	Talc	8
	Zinc oxide (zinc flower)	5
	Solid petrolatum wax	2
5	Stearyl alcohol	8
	Liquid petrolatum	15
	Cyclic dimethyl polysiloxane	Balance
	Sorbitan fatty acid ester	1
	Antibacterial zeolite B	5
10	Polyoxyethylene polyoxypropylene 2-decyltetradecyl ether (22 E.O.) (15 P.O.)	4

[0084]

Example 13: Cream

	Purified water	Balance
15	Squalane	20 mass %
	Cyclic dimethyl polysiloxane	15
	Glyceryl diisostearate	3
	Diethoxyethyl succinate	5
	Organically modified montmorillonite	
20		1.5
	1,3-butylene glycol	5
	Antibacterial zeolite A	5
	Polyoxyethylene polyoxypropylene 2-decyltetradecyl ether (24 E.O.) (13 P.O.)	2

25 [0085]

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Example 14: Emulsion

	Purified water	Balance
	Aluminum hydroxychloride	20 mass %
	Octyl paramethoxycinnamate	5
5	4-tert butyl-4'-methoxybenzoylmethane	1
	Hydrophobically treated zinc oxide	5
	Polyoxyethylene/polypropylene random polymer	
	methyl ether	10
10	Silicone oil	15
	Silicone resin	1
	Glyceryl diisostearate	1
	Organically modified montmorillonite	0.5
15	1,3-butylene glycol	5.5
	Antibacterial zeolite B	13
	Polyoxyethylene polyoxypropylene 2-decyltetradecyl	
	ether (25 E.O.) (11 P.O.)	1

[0086]

20 Example 15: Ointment

	Purified water	Balance
	Aluminum hydroxychloride	20 mass %
	Glycerin	10
	1,3-butylene glycol	3
25	Caustic potash	0.25

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	Stearic acid	2
	Stearic acid monoglyceride	2
	Cetanol	1
	Liquid petrolatum	5
5	Petrolatum	2
	Antibacterial zeolite B	1
	Polyoxyethylene polyoxypropylene 2-decyltetradecyl ether (20 E.O.) (16 P.O.)	2.5

[0087]

10 Example 16: Gel

	Purified water	Balance
	Aluminum hydroxychloride	20 mass %
	Dipropylene glycol	5
	PEG 1500	5.5
15	Carboxyvinyl polymer	0.4
	Methylcellulose	0.2
	POE(15) oleyl alcohol ether	0.5
	Potassium hydroxide	0.1
	EDTA	0.02

20	Antibacterial zeolite B	5
	Polyoxyethylene polyoxypropylene 2-decyltetradecyl ether (26 E.O.) (12 P.O.)	0.3

[0088]

Example 17: Wet sheet

25	Purified water	Balance
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Anhydrous ethyl alcohol 35 mass %

Polyoxyethylene hydrogenated castor 0.1

Citric acid (food) 0.02

Sodium citrate 0.06

5 Antibacterial zeolite B 2

Polyoxyethylene polyoxypropylene 2-decyltetradecyl
ether (26 E.O.) (12 P.O.) 0.01

[Industrial applications]

[0089]

10 The present invention is an endermic
liniment containing antibacterial zeolite that
exhibits the effect of preventing staining of
clothing due to adhesion of the endermic liniment
and/or reducing the degree of such staining.

15

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[Document title] Abstract

[Abstract]

[Object] The object is to provide an endermic
liniment containing antibacterial zeolite that
5 exhibits the effect of preventing discoloration of
the endermic liniments and/or reducing the degree
of discoloration.

[Means to achieve the object] An endermic
liniment comprising antibacterial zeolite and
10 polyoxyethylene polyoxypropylene 2-decyltetradecyl
ether.

[Selected drawings] None